
The Clothes Make the mRNA: Past and Present Trends in mRNP Fashion.

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Public Summary:

Throughout their lifetimes, messenger RNAs (mRNAs) associate with proteins to form ribonucleoproteins (mRNPs). Since the discovery of the first mRNP component more than 40 years ago, what is known as the mRNA interactome now comprises >1,000 proteins. These proteins bind mRNAs in myriad ways with varying affinities and stoichiometries, with many assembling onto nascent RNAs in a highly ordered process during transcription and precursor mRNA (pre-mRNA) processing. The nonrandom distribution of major mRNP proteins observed in transcriptome-wide studies leads us to propose that mRNPs are organized into three major domains loosely corresponding to 5' untranslated regions (UTRs), open reading frames, and 3' UTRs. Moving from the nucleus to the cytoplasm, mRNPs undergo extensive remodeling as they are first acted upon by the nuclear pore complex and then by the ribosome. When not being actively translated, cytoplasmic mRNPs can assemble into large multi-mRNP assemblies or be permanently disassembled and degraded. In this review, we aim to give the reader a thorough understanding of past and current eukaryotic mRNP research.

Scientific Abstract:

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